

COMISSÃO LATINO-AMERICANA
DE AVIAÇÃO CIVIL



LATIN AMERICAN CIVIL
AVIATION COMMISSION

COMISIÓN LATINOAMERICANA DE AVIACIÓN CIVIL

SECRETARÍA
APARTADO 27032
LIMA, PERÚ

CLAC/CE/84-NE/10
08/08/13

LXXXIV REUNIÓN DEL COMITÉ EJECUTIVO DE LA CLAC

(Ciudad de Panamá, Panamá, 27 y 28 de agosto de 2013)

**Cuestión 9 del
Orden del Día:**

**Participación de la CLAC en el 38 período de Sesiones de la Asamblea de
la OACI**

- *Notas de estudio que presentará la FAA/USA*

(Nota de estudio presentada por la Secretaría)

1. Con motivo de la Reunión del Grupo *ad hoc* encargado de elaborar la “Guía de orientación para el 38 periodo de Sesiones de la Asamblea de la OACI” (Bogotá, Colombia, 2 y 3 de mayo de 2013), esta Secretaría recibió en mano tres notas de estudio elaboradas por los Estados Unidos de América para el 38 Período de Sesiones de la Asamblea de la OACI, a realizarse en Montreal, Canadá, del 24 de septiembre al 4 de octubre del presente año. En ese sentido, como **Adjunto** se acompañan dichas notas, con el objeto que los Estados miembros de la CLAC analicen la posibilidad de brindar apoyo a los mencionados documentos.

Medidas propuestas al Comité Ejecutivo

2. Se invita al Comité Ejecutivo a revisar las Notas de la FAA/USA, que se acompañan a la presente y pronunciarse sobre el apoyo a las mismas.

DRAFT – THIS PAPER HAS NOT RECEIVED ALL OFFICIAL U.S.
CLEARANCES AND IS STILL SUBJECT TO CHANGES



International Civil Aviation Organization

North American, Central American and Caribbean Office (NACC)

**Thirteenth Meeting of Directors of Civil Aviation of the Central Caribbean
(C/CAR/DCA/13)**

Havana, Cuba, 28–31 May 2013

C/CAR/DCA/13 — WP/**

//13

Agenda Item *:

Global Air Navigation Plan (GANP)

**SUPPORT FOR THE GLOBAL AIR NAVIGATION PLAN, AVIATION
SYSTEM BLOCK UPGRADES AND REGIONAL IMPLEMENTATION**

(Presented by the United States)

EXECUTIVE SUMMARY

A significant outcome of the International Civil Aviation Organization (ICAO) 12th Air Navigation Conference (ANC/12) was an agreement in-principle, by the Conference, to support the Global Air Navigation Plan (GANP) and the Aviation System Block Upgrade (ASBUs) concept. ANC/12 also recommended that ICAO define a stable and efficient process for endorsing the GANP and ASBUs, by the 38th Session of the ICAO Assembly.

While the Conference agreed in-principle, there remain common misconceptions among States, Regional Groups and Industry regarding the GANP and ASBUs, which may lead States to hesitate their endorsement during the 38th Session of the ICAO Assembly. These misconceptions center around the structure of the ASBUs, the potential to have mandatory modules, the associated timeframes, and implementation.

The United States views the endorsement of the GANP as a positive direction and the ASBUs as the framework for implementation of future capabilities. This paper details the United States view towards a regional implementation framework and provides an overview of an economic analysis framework.

Action: The Conference is invited to agree with the recommendations in paragraph 6.

Attachment: Economic Benefit Analysis for United States Next Generation Air Transportation System (NextGen)

1. INTRODUCTION

1.1 In order to coordinate a constantly evolving global air navigation system, it is important to have a harmonized plan for aviation regulators, operations and industry to follow. The planning, development, training and implementation of a globally harmonized system is contingent on a framework that includes scalable plans and provides the expected operational, economic and safety benefits.

DRAFT – THIS PAPER HAS NOT RECEIVED ALL OFFICIAL U.S.
CLEARANCES AND IS STILL SUBJECT TO CHANGES

— 2 —

1.2 The proposed GANP and ASBUs, provide the strategic direction, with clearly defined and measurable operational improvements as well as economic benefits. The GANP and ASBUs help regulators; operators; and industry derive the positive business cases and allow for a scalable and customized approach. The ASBUs, outline the air and ground equipment, timelines, and standards and procedures necessary for implementation.

1.3 We believe States and Regions face three primary challenges with GANP and ASBUs: 1) understanding the GANP and ASBU core plans; 2) ASBU implementation; and 3) guidance on relating applicable economic issues to an implementation business case. The United States offers to clarify the GANP and ASBUs and propose a plan for regional implementation and an example of an economic framework.

2. GANP

2.1 The GANP is the overarching framework or plan, for the next 15 years. The plan includes key civil aviation policy principles to assist ICAO Regions, sub-regions and States with the preparation of their Regional and State air navigation plans. The objective of the GANP is to increase the capacity and efficiency of the global civil aviation system, through a harmonized approach, while improving or at least maintaining safety.

2.2 The framework contained in the GANP outlines a logical architecture for air traffic management to utilize in ensuring that global aviation systems are harmonized and prioritized. The architecture is built around Performance Based Navigation (PBN) which was endorsed during the 37th Session of the ICAO Assembly. The GANP is also closely tied to ICAO Doc. 9854- *Global Air Traffic Management Operation Concept*; Doc. 9882- *Manual on Air Traffic Management System Requirements*; and ICAO Doc. 9883- *Manual on Global Performance of the Air Navigation System*.

2.3 The GANP provides States and Regions with greater flexibility on how they may move forward with implementing new systems and technologies. States will need to map their individual or regional programs to the GANP and will require active collaboration through the Planning and Implementation Regional Groups (PIRGs) for implementation.

3. ASBUs

3.1 The ASBUs are the "tool box" States and Regions will utilize to implement the GANP. The concept behind the ASBUs, enables each State to decide for themselves what technologies and systems they will need to be interoperable and harmonized within their region.

3.2 There are four blocks – each Block contains a package of upgrades, called modules, which individual performance capabilities. The Blocks are numbered based on the dates those capabilities will be available for implementation.

- Block 0 can be fully implemented by the end of 2013;
- Block 1 can be fully implemented by 2018;
- Block 2 can be fully implemented by 2023; and
- Block 3 can be fully implemented by 2028.

DRAFT – THIS PAPER HAS NOT RECEIVED ALL OFFICIAL U.S.
CLEARANCES AND IS STILL SUBJECT TO CHANGES

— 3 —

3.3 A module is a specific upgrade or "tool" contained within a Block. The modules are organized into specific performance target areas. The areas include; airport operations, interoperable systems and data, globally collaborative ATM and efficient flight paths. The modules contained in Block 0 are the basic technologies. The modules continue to evolve and continue to full maturity by Block 3.

3.4 The ASBUs and modules are not mandatory. They should be deployed, if and when, a State or Region can benefit from the particular upgrade. This concept is different from that of the aviation safety oversight structure. For example, the safety oversight structure requires implementation of eight critical safety elements. Some States and Regions may only choose to deploy a minimal number of modules, while other States and Regions may choose to deploy full Blocks. The United States will implement a majority of modules in our air navigation system; however, we will not deploy all modules to every area within the United States.

4.0 Prioritization and Regional Implementation

4.1 As the primary mechanism for developing and implementing regional plans, the PIRGs will need to take an active role in coordinating with their accredited States in the development of a regional framework which will incorporate the GANP and ASBUs. The PIRGs will also need to increase cross-regional coordination between each other, and may benefit from ICAO hosting All Planning and Implementation Regional Group (ALLPIRG) meetings, or from Global coordination meetings. Regional Air Navigation Plans (ANPs) and Regional Supplementary Procedures (SUPPs) will also need to be maintained and regularly updated to account for the many advancements and timelines proposed in the GANP and ASBUs.

4.2 In order to efficiently implement the above, Regions, PIRGs and States should establish a systematic process to determine their specific needs. The process should consist of stages. The following stages are recommended: Analysis, Assessment, Implementation and Monitoring.

4.3 The Analysis stage should begin with an analysis of stakeholder needs to include: capacity, routes, user requirements, environment, safety, current air traffic flows and forecasting for both civil and military operations. Once these needs are analyzed, a review of the State's Air Navigation Plans (ANPs) and Facilities and Services Implementation Document (FASID) should be conducted to determine performance and capability gaps.

4.4 The Assessment stage will identify mitigating factors of the performance and capability gaps. The mitigating factors will assist Regions and States in selecting and prioritizing their relevant modules. After the relevant modules are determined, a cost benefit analysis will provide the business case for deployment. At the end of the Assessment phase Regions and States will need to obtain stakeholder commitment before advancing to the implementation stage.

4.5 The Implementation stage begins with amending regional implementation plans based on the relevant modules and a positive business case. States would then update their individual ANPs to reflect their participation in regional plans. States, with the help of their ICAO Regional Office, will then need to ensure that the regulatory and training requirements are developed and in place.

4.6 After implementation, States would report progress and performance to their ICAO Regional Office and PIRG, which in turn would update the regional plans as needed. The reporting process continues as it is reviewed, validated and monitored and reported to ICAO Montreal in the Air Navigation Capacity and Performance Report. Finally, when all regional reports are consolidated at ICAO Montreal, there will be a clear picture of global implementation and deployment of the ASBUs.

5.0 Economic Analysis Framework

5.1 One of the biggest challenges for the implementation and deployment of the ASBUs is developing a positive business case through a cost benefit analysis. There are multiple ICAO guidance documents regarding the economics of air navigation that should be referenced when conducting a business case analysis. These documents include:

- ICAO's Policies on Charges for Airports and Air Navigation Services (Doc 9082)
- Manual on Air Navigation Services Economics (Doc 9161)
- Economics of Satellite-based Air Navigation Services (Circ 257)
- Report on the Financial and Related Organizational and Managerial Aspects of Global Navigation Satellite System (GNSS) Provision and Operation (Doc 9660)
- ICAO Council provisional policy guidance on the allocation of the incremental costs of more advanced GNSS
- Manual on Air Traffic Forecasting (Doc 8991)

5.2 International organizations and industry groups can also help to prepare an economic analysis and business cases. The International Air Transport Association (IATA) conducted a thorough analysis for the Asia Pacific Region and presented its findings at the Third Meeting of the ICAO Asia/Pacific Seamless ATM Planning Group held in January, 2013.

5.3 Attached is a synopsis that provides a framework of the economic benefits derived from the United States Next Generation Air Transport System (NextGen). The synopsis is intended to provide an overview of the United States framework and variables analyzed to derive costs and benefits.

6.0 Conclusion

6.1 The GANP and ASBUs provide a strategic and tactical direction to advancing and harmonizing international air navigation systems in a safe and efficient manner. While there has been much confusion about the GANP and ASBUs, it should be noted that the only mandate is that States and Regions work together and map their individual plans to the GANP. The ASBUs are the toolkit to use in implementing the GANP and should only be deployed when a State or Region can benefit from the particular upgrade.

6.2 Based on the above considerations, the Conference is invited to agree to the following recommendations:

That the Conference:

- a) agree to endorse the GANP and ASBUs at the 38th Session of the ICAO Assembly;
- b) consider the framework for prioritization and regional implementation; and
- c) consider the attached economic analysis framework as information in developing their business case

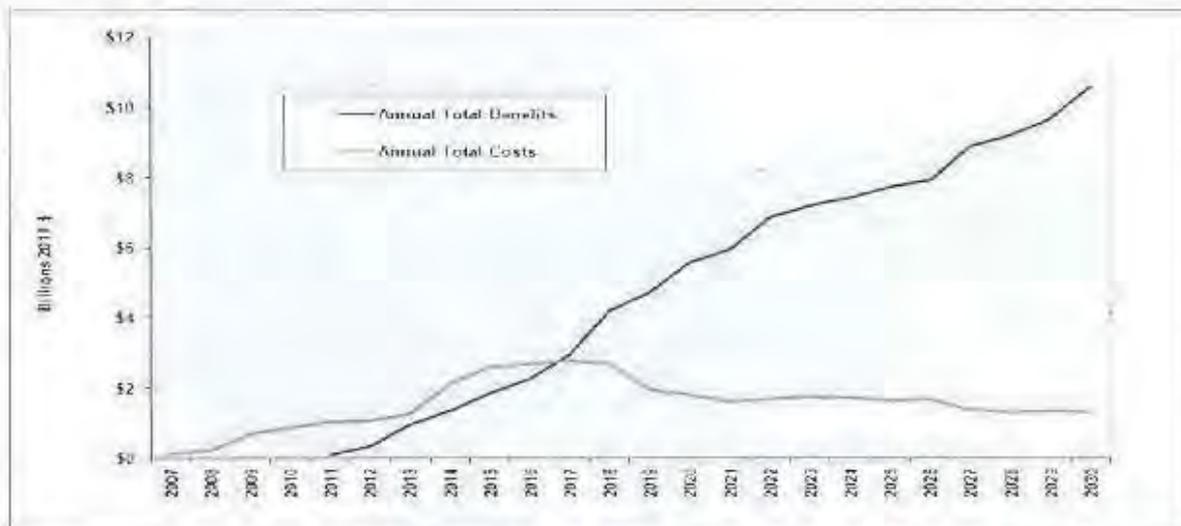
Attachment

**Economic Benefit Analysis for United States Next Generation Air Transportation System
(NextGen)**

NextGen is a wide-ranging transformation of the air transportation system, including air traffic management technologies and procedures; airport infrastructure improvements; and environmental, safety and security-related enhancements. The FAA’s business case addresses only the air traffic management aspects of NextGen, as the costs of these improvements are most directly borne by the FAA and system users. The U.S. considers the costs and benefits of addressing the shortfalls of the current system with new technologies. As noted in the GANP, each state will implement the ASBUs and modules that are appropriate to its airspace. Not every portion of the ASBUs will be applicable to every airspace. The following sections note how the United States developed the case for its NextGen system.

Benefit-Cost Analysis of Mid-Term Improvements

The cost and benefit calculations underlying this business case have been developed based on the plans described in the FAA’s 2011 Mid-Term Concept of Operations and the NextGen Implementation Plan. Our modeling of the benefits and costs of NextGen relies on various inputs. For basic inputs, the U.S. relied on traffic data from fiscal year 2010, along with traffic and fleet forecasts released in early 2011. Recommended economic values, such as those for passenger value of time, etc., are from 2011. Based on these inputs, our analysis shows that NextGen mid-term improvements will generate \$106 billion in benefits for the nation as a whole through 2030, compared to costs of \$37 billion. The figure below illustrates the annual cash flows for these benefits and costs.



Estimated Benefits of NextGen Improvements

DRAFT – THIS PAPER HAS NOT RECEIVED ALL OFFICIAL U.S.
CLEARANCES AND IS STILL SUBJECT TO CHANGES

— 6 —

This business case focuses on the direct benefits to aircraft operators, passengers, and taxpayers from the rollout of NextGen improvements.

Types of benefits included in the business case are:

- Reduced airline direct operating costs (ADOC)
- Passenger value of time (PVT)
- Reduced FAA operating costs
- Additional flights enabled by greater capacity
- Reduced flight cancellations
- Increased safety
- Environmental benefits from reduced aircraft emissions (CO₂ only).

The FAA's System Wide Analysis Capability (SWAC) is a fast-time simulation model that we used to estimate the potential benefits of NextGen improvements in the NAS. SWAC calculates delay and fuel burn savings along with the potential for an increase in accommodated flights achieved by the various NextGen mid-term improvements working together. At its core, SWAC is a discrete-event queuing model.

NAS resources that may be capacity constrained—such as sectors, arrival or departure fixes, or airports—are represented as “servers” in the queuing model. SWAC contains server representations for all en route sectors in CONUS airspace, 110 domestic airports, terminal airspace at the 35 busiest airports, and in-trail constraints for aircraft entering oceanic airspace. In order to represent the demand on those servers with any accuracy, each flight must be modeled at a very detailed level.

In its current iteration, SWAC models a subset of NextGen-enabled improvements to the operating environment. Nearly 85 percent of the cumulative benefits by value are modeled directly in SWAC. The remaining benefits are based on FAA studies.

The resulting benefit estimates are as follows:

- The benefit of avoided delay – estimated at \$77 billion from 2011 through 2030 – is by far the largest component.
- The remainder of benefits, including safety improvements, FAA cost savings, more direct routings for flights, fewer cancellations, and reduced CO₂ emissions, total \$29 billion through 2030.

In constant 2011 dollars, the FAA's total investment in NextGen is projected to be \$18 billion through 2030 to achieve mid-term improvements.

Investment by aircraft operators is also expected with NextGen implementation. This investment includes the purchase and installation of the avionics necessary to take advantage of NextGen's capabilities. The technologies which the U.S. considers are Automatic Dependent Surveillance – Broadcast (ADS-B) Out, ADS-B In, Data Communications, and RNP navigation. While most of these expenses will be borne directly by aircraft owners and operators rather than by the FAA, it is an important component of the overall investment of NextGen. Over time, the annual benefits of NextGen will increase as new capabilities are brought into service.

The United States can make more of the data used to calculate the NextGen cost/benefit analyses available to other interested States. The U.S. can also provide additional information, criteria, and step-by-step analyses used to determine these benefits.

DRAFT – THIS PAPER HAS NOT RECEIVED ALL OFFICIAL U.S.
CLEARANCES AND IS STILL SUBJECT TO CHANGES

— 7 —

The data cited above is from the 2012 Business Case for NextGen.

— END —



Agenda Item *:

ACTION PLANS ROLE IN REDUCING GREENHOUSE GAS EMISSIONS FROM AVIATION

(Presented by the United States)

SUMMARY	
<p>This paper encourages the submission of State action plans to the International Civil Aviation Organization in support of reducing greenhouse gas emissions from aviation. Action plans serve an important role in identifying individual State activities to address climate change impacts of aviation. The paper supports enhancements to improve overall quality and robustness of action plans at the 38th ICAO Assembly.</p>	
References:	
<ul style="list-style-type: none"> • US Climate Action Plan • ICAO Assembly Resolution A37-19 	
<i>Strategic Objectives</i>	<i>This working paper is related to Strategic Objectives *</i>

1. INTRODUCTION

1.1 ICAO Assembly Resolution A37-19 introduced a collective, medium-term global goal of carbon neutral growth by 2020. Under the resolution, States were urged to submit action plans to ICAO to identify domestic actions and policies to reduce greenhouse gas (GHG) emissions from aviation. State action plans demonstrate the important actions that many states are taking to reduce aviation emissions. Action plans can also help measure progress towards the ICAO aspirational goal. According to the ICAO Secretariat, as of April 2013, 59 ICAO Member States, representing over 77 percent of global air traffic have submitted plans to ICAO. Action plans help ICAO demonstrate commercial aviation’s efforts to reduce emissions.

2. DISCUSSION

2.1 The United States is committed to addressing the impacts of climate change from commercial aviation and utilizes a multi-pronged approach to achieve GHG emissions reductions. Consistent with the Assembly Resolution A37-19, the United States has already submitted an action plan, the U.S. Greenhouse Gas Emissions Reduction Plan, in 2012.

2.2 The U.S. action plan provides a snapshot of the actions that the United States Government is taking, in collaboration with stakeholders, to reduce GHG emissions from aviation. Actions include technology development, operational improvement, development and deployment of sustainable alternative aviation fuels, and implementation of policies and measures. A copy of the U.S. action plan can be found at http://www.faa.gov/about/office_org/headquarters_offices/apl/research/.

2.3 As noted in Paragraph 1.1, the United States is not alone. Many other states have also submitted action plans. Together these plans are an important element of demonstrating progress toward addressing the climate change impacts of aviation.

2.4 While the initial effort to prepare action plans was a good first step, there are opportunities to improve on them to better capture the important actions that ICAO States are taking to reduce emissions from aviation. For example, while many States have submitted action plans, not all of them have been shared for other states and stakeholders to review. A key benefit of the action plans is to demonstrate to others the good work that States are doing and therefore, the plans should be made public.

2.5 The 38th Assembly provides an opportunity to enhance the role of action plans. In addition to committing to make action plans public and to share them with other States, States should also be encouraged to update the plans on a three year basis in order to provide new and updated information as it becomes available. While States should continue to have the flexibility to determine the contents of their action plan, efforts should be made to provide consistent information in the plans that can help demonstrate overall progress toward ICAO aspiration goals. The ICAO Secretariat can continue to play a vital role in assisting States with the development of their action plans.

3. ACTION BY THE CONFERENCE

3.1 States are invited to:

- a) Note the important role of climate action plans in demonstrating the commitment of ICAO States to the global goal of reducing emissions from international aviation;
- b) Support an ICAO Assembly Resolution that encourages States to improve on action plans, to submit them on a periodic basis, and to make them publicly available.



Agenda Item 3: 38th Session of the ICAO Assembly

Support for a Global Safety Framework

(Presented by the United States)

SUMMARY

The Global Aviation Safety Plan (GASP) was developed as a high level policy document to coordinate the efforts of States, industry, and international organizations in pursuit of the safe and orderly development of civil aviation. The United States supports the GASP as the framework for States to develop their national and regional safety management initiatives. However, for the GASP to be successfully implemented, this framework must be centered on broad collaboration and equal partnership amongst States, the aviation industry, and other stakeholders, to work together towards a mutually beneficial goal of promoting continuous improvement to the safety, efficiency, and integration of the international aviation system. The revised GASP will be presented at the upcoming Assembly, and the United States is seeking the support of States and aviation stakeholders in endorsing the GASP, with a focus on system compatibility, harmonization of technical standards, partnership amongst stakeholders, and the promotion and sharing of best practices.

References:

•

Strategic Objectives

*This working paper is related to Strategic Objectives **

I. INTRODUCTION

1.1. The United States is preparing for the upcoming ICAO 38th Assembly, and is seeking cooperation with foreign partners on commitment for a common framework that provides for the management of safety through broad collaboration amongst regulators and industry. Such an approach will aid in collecting and integrating the necessary safety

information that will foster predictive decision-making and promote greater partnerships across all aviation stakeholders.

- 1.2. The Global Aviation Safety Plan (GASP) will be presented for approval by the Assembly, and was developed as a high level policy document to coordinate the efforts of States, industry, and international organizations in pursuit of the safe and orderly development of civil aviation. The United States supports the GASP as the framework for States to develop their national and regional safety management initiatives. However, for the GASP to be successfully implemented, this framework must be centered on broad collaboration and equal partnership amongst States, the aviation industry, and other stakeholders, to work together towards a mutually beneficial goal of promoting continuous improvement to the safety, efficiency, and integration of the international aviation system.
- 1.3. The GASP delineates the safety management responsibilities at an international, regional, and national level. The collective implementation of such a framework at these varying levels will provide a clear direction on the global state of aviation safety, as intended. For such a framework to function, the GASP must serve as a tactical guide to determining the approach to these responsibilities at each level.

2. Discussion

- 2.1. To effectively implement such a framework, the international community should seek to support aviation safety initiatives that ensure a collaborative approach to the proactive management of safety with a focus on; system compatibility, harmonization of standards, partnership between States and industry, and the promotion of best practices

System compatibility

- 2.2. As the flow of aircraft, operations, and aviation infrastructure becomes increasingly integrated, States oversight responsibilities are becoming increasingly interdependent. The development of internationally relevant Standards and Recommended Practices (SARPs) provide a basic foundation for the management of these interdependent oversight obligations of national systems. To ensure the viability of future SARPs and amendments to the existing SARPs, the development process must consider the multiple components that affect the ability to implement a SARP into a national or regional system. The assessment process should incorporate a wider analysis into the technical feasibility, economic impact, administrative complexity, and legal capability that may affect the ability of States or regional oversight organizations to implement such a change within their system.
- 2.3. In addition to this basic foundation set in place by SARPs, States must seek broad system-wide compatibility in the performance of these Standards. An ability of a State to accept the findings, certificates, or approvals of another State is based not solely on the existence of similar requirements, but on the performance of those requirements within

unique national or regional systems. Compatible systems are based both on the adherence to international Standards as well as the ability to accept the performance of those Standards under the jurisdiction of another oversight system, wherein compatible systems yield equivalent safety management capabilities and result in increased opportunity for collaboration and acceptance of oversight functions.

- 2.4. The United States is very supportive of the work thus far accomplished by the recently formed ICAO Safety Management Panel, and views the foundation established by the new Annex 19 as paramount to the international system compatibility necessary for an equivalent safety management approach.

Harmonization

- 2.5. To avoid unnecessarily duplicative oversight and actively promote interoperability, States should seek harmonization of technical standards to the utmost extent possible. The justification for a harmonized requirement must be based on safety data and potential for decreased risk.
- 2.6. The development of requirements is both a technical and political action, and all oversight authorities are bound to comply with varying degrees of autonomy from their governing authority. However, Contracting States should work together with standards organizations to coordinate the development of requirements, with the common foundation of these requirements being universally recognized data.

Partnership

- 2.7. To continuously improve safety, all stakeholders must jointly approach management of the risk factors that are most likely to cause aviation accidents and incidents in a cohesive, collaborative, and mutually beneficial manner. Proactive management of principal fatality risk factors demands a strong partnership between both the regulatory community and the industry it oversees, with the ultimate shared goal of predicting and mitigating the potential for an accident. The United States promotes such an approach through the collection, analysis, and sharing of safety information with an emphasis on joint regulatory and industry partnership.
- 2.8. A collaborative approach between the regional regulatory community, industry, and aviation stakeholders is critical to the success of these groups, as regional performance cannot be determined without a free flow of information that serves the sole purpose of promoting mutually beneficial safety goals.

Best Practices

- 2.9. The collective experience of the aviation community in managing situations such as aviation accidents, natural disasters, pandemics, and other major national or international incidences should be used as a foundation towards improving response time and returning to normal operations while still ensuring a safe and functional system.

Continuously striving for a safer, more efficient aviation system demands the ability to build upon past lessons learned, share experiences and information across stakeholders, and ultimately incorporate best practices into national or regional oversight frameworks.

3. ACTION BY THE MEETING

3.1. The meeting is invited to:

- a) The United States supports the GASP, and would like to work collaboratively with foreign partners to ensure its adoption by the Assembly.
- b) For the GASP to be successfully implemented, States must determine the necessary elements that affect the ability of such a framework to function within their unique systems.
- c) Thus, the United States seeks support on the four criteria as outlined above - system compatibility, harmonization, partnership, and promotion of best practices - as being fundamental components of a global safety framework.

C/CAR/DCA/13 — WP/**

— 6 —

or

— END —